Listing of Claims:

1. (Currently Amended) An optical module arranged in an optical transmission path, comprising:

an optical amplifying unit configured with a semiconductor, wherein the optical amplifying unit amplifies ~~in high gain~~ light input from the optical transmission path; and

an optical element configured with a semiconductor, wherein the optical element ~~includes an optical modulator, an optical switch or a directional optical coupler and~~ propagates the light amplified by the optical amplifying unit to the optical transmission path, and gain of the optical amplifying element is sufficiently hight that insertion loss of the optical module is completely compensated..

2-3. Canceled.

4. (Original) The optical module according to claim 1, wherein the optical element comprises:

a first optical waveguide through which light from the optical amplifying unit propagates;

a second optical waveguide through which light propagates, wherein the second optical waveguide optically crosses the first optical waveguide to form a crossing portion;

a first lead electrode arranged along the first optical waveguide and the second optical waveguide;

a pair of first control electrodes arranged along the first optical waveguide so as to face each other, with the crossing portion therebetween, to which a control voltage controlling a crossing state is applied via the first lead electrode;

a second lead electrode arranged so as to face the first lead electrode; and

a pair of second control electrodes arranged along the second optical waveguide so as to face each other, with the crossing portion therebetween, to which the control voltage is applied via the second lead electrode.

5. (Original) The optical module according to claim 4, wherein the first lead electrode and the second lead electrode are arranged so as to face each other, with the first optical waveguide and the second optical waveguide arranged therebetween.

6. (Original) The optical module according to claim 5, wherein the first lead electrode and the second lead electrode are arranged substantially parallel with each other.

7. (Original) The optical module according to claim 4, wherein the first optical waveguide and the second optical waveguide are arranged in a physically solid crossing state.

8-11. Canceled.

12. (Original) The optical module according to claim 4, wherein each of the first control electrodes and the second control electrodes have a control electrode piece divided into a plurality of parts in the longitudinal direction.

13. (Original) The optical module according to claim 12, wherein each of the first optical waveguide and the second optical waveguide has a PIN structure in which an I-core layer is put between a P-cladding layer and an N-cladding layer, in regions other than the regions immediately below the control electrode pieces, which are adjacent to each other in the longitudinal direction, wherein corresponding control electrode piece is deposited on the P-layer,

the optical waveguide immediately below a region between the control electrode pieces adjacent to each other in the longitudinal direction has a structure in which the P-layer is removed from the PIN structure, and

the N-layer in the PIN structure is a common layer to the first optical waveguide and the second optical waveguide.

14. (Original) The optical module according to claim 4, wherein each of the first optical waveguide and the second optical waveguide has the PIN structure of a three-layer type or an I-layer buried type, wherein in the case of the three-layer type, the first control

electrode and the second control electrode are deposited respectively on the P-layer of the first optical waveguide and the second optical waveguide, and in the case of the I-layer buried type, the first control electrode and the second control electrode are deposited respectively on the I-layer of the first optical waveguide and the second optical waveguide, N-layer of the first optical waveguide and the second optical waveguide are deposited, and the first optical waveguide and the second optical waveguide have a common N+ layer to which a DC bias voltage is applied.

15-17. Canceled.